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Ebbesen, Toke Riis

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The Systime iBog: Analyzing Digital Textbooks as Designed Artifacts

Toke Riis Ebbesen

Biography

Toke Riis Ebbesen, PhD, assistant professor at the SDU Design research unit, University of Southern Denmark in Kolding. He is a researcher in design communication, digital design & publishing, based within the academic fields of design history, material culture and product semiotics. Previously he worked in the cultural industry and in the publishing business, as project manager and as an independent digitally experimenting micro-publisher.

Email: tre@sdu.dk

Twitter: [@tokeriis](https://twitter.com/tokeriis)

Abstract

This article proposes a method for critical analysis of design contributions and the material properties of digital textbooks aimed at tertiary schools, in the transition to digital publishing and from paper-based books to digitally available learning materials. The suggested method, adapted from an analytic methodology proposed by design semiotician Proni (Proni, 2002; Proni, 2010), is grounded in a material and cultural interdisciplinary perspective on books as designed artifacts. The method, combining close descriptions of material properties, production, use and cultural framing, is shown to be sufficient for predictive and practical design purposes in an analysis of the digital textbook the iBog by the Danish publisher Systime.

Keywords

Digital, textbooks, design analysis, e-books, e-learning, materiality

Introduction

The late Umberto Eco famously claimed that, “(...) either the book will continue to be the medium for reading, or its replacement will resemble what the book has always been, even before the invention of the printing press.”(Carrière, Eco, and Tonnac, 2011, 4). Today the development of book publishing seems to have surpassed the sentiment of Eco, at least in the educational market in Denmark. Textbooks aimed at secondary schools in Denmark (note 1) increasingly transition from printed versions to various new media forms, and many of these only partially resemble books in the traditional sense as the new digital formats enables a larger degree of visual and interactive freedom than earlier textbooks bound by the restraints of the paper. Textbooks can be understood as materials supporting learning and teaching within a narrowly defined yearly or thematically organized curriculum, often intended as a principal source of study material for a class or group of students(Larson, Allen, and Osborn, 2010, 1). Nonetheless, what such a definition doesn't tell us is how such a material is designed and used, neither is it very informative in regard to digital materials. This article will suggest a methodological framework for design analysis of digital textbooks.

A series of digitizations has affected the production, distribution and consumption practices of textbook publishing today, as well as the books themselves, who seems to become something less fixed, and more liquid objects(Hall, 2013; McGuire and O'Leary, 2012). What we used to call 'design' and the persons doing the design, the 'designers', has in the wake of these radical changes also changed, within in publishing as well as in most other areas of design(Julier, 2013). Beginning with the the personal computer and Desktop publishing in the 80's, graphic designers were to a high degree delegated a special role in relation to the publishing business. But as more than just typesetting, but progressively new parts of the publishing infrastructure, organization, distribution and consumption of textbooks are digitized, this earlier role has changed. Hence, the whole concept of "design" in relation to books, is increasingly dispersed and scattered. We are not only in need of a revision of Robert Darnton's canonical model of the communication circuit of the book(Darnton, 1982) to take into account the communicative changes caused by digitization, as suggested by Murray and Squires(Murray and Squires, 2013); we also need to model how design contributions change in the transformative context of the digitization of the educational publishing business.

What do I mean by design contributions? Central to designing is that, although the meaning of the design may be 'cultural' or defined in interplay with social forces(Julier, 2013, 5), something, a tangible object, is created or given a perceptible, manifest materiality as a result of design contributions. In this I follow the materialism turn in design related studies(Attfield, 2000; Miller, 2005; Miller, 1987; Dant, 1999) and in media studies(Bogost, 2012; Herzogenrath, 2015) and HCI(Jung and Stolterman, 2012; Wiberg, 2014). In short, although it is fashionable to speak of design as facilitation of processes and other immaterial phenomena, such as “service design”(Kimbell, 2009), “social design”(Manzini, 2014), or even “design thinking”(Kimbell, 2011), designers' primary job is to create tangible artifacts, which we can touch and interact with, even though these artifacts may be digital(Wiberg, 2014). This means that design contributions can be seen as practices by which textbooks “objectifies sociality,” as design historian Judy Attfield defines design(Attfield, 2000, 12).

Equally important, the materiality of an artifact is not only a result of design practices or communication mediating designer's intentions; the material design of books in turn also affects the practices of use, sociality and discourses of the people involved with them. In other words: books are active mediators or agents of change, not passive vehicles of communication. It follows that any transition from print to digital is inconceivable without changes in how design contributions are organized and conceived. The aim of the following is to understand this through a conceptual analytical model of how design changes and is manifested in the design of digital textbooks conceived as new media products that can be used as learning materials. To construct such a model, I shall use a methodology for analysis of artifacts of use inspired by Giampaolo Proni(2002; 2010), and ultimately from the line of pragmatic phenomenological semiotics inspired by CS Peirce

(1934). In the second part of the article, the analytical approach is applied in a case study of a danish digital textbook.

The method

In his presentation of the proposed methodology Proni states that to perform a semiotic analysis of useful artifacts means to model or simulate how a community of interpreters at a specified time and place interprets and acts on artifacts (Proni, 2002, p.38). In contrast to pure mental or intersubjective signs, such as spoken words and thoughts, artifacts always features perceivable material features that influences their use and interpretation (Peirce, 1934, p.5.287). While textbooks from a common sense viewpoint primarily contain texts that have a communicative character, considered as artifacts they also carry meaning because they are material and are used for some purpose. For printed books such an artifactual analysis would describe the binding and cover of the book (materials used, illustrations, typography, stitching/glue, etc.), the book matter (paper type, layout, typography, use of colors, chapter-, section- or paragraph structure, and navigational aids such as tables of content, headers or indexes), as well as para-artifacts, such as accompanying teachers' books and student readers. From these perceptual characteristics of an artifact it is possible both to infer something about its potential use, how it came in to existence and the production circumstances leading to its creation.

First, by examining the material properties of artifacts and using previous knowledge, you can infer how it was produced, what processes and technologies were used and what materials were consumed in the process. For instance, from the shape of a stone axe, it is possible to infer what techniques were used to cut it, what general period and area it was produced in, what kind of stone it was carved from, and so on. Modern industrial artifacts are often much more complex than stone tools and often users may have a very superficial working knowledge of their productive origin. A student may not spend much time considering who published and authored their textbook, or what pedagogical considerations resulted in its particular layout. But in analysis you may still infer much about its production by examining its perceptual characteristics. You may supplement this with studies of the publishing company, with historical knowledge of the textbook market in the country, with further research on how designers were involved, how they affected the final design and so on. Digital textbooks are often even more elaborate artifacts than the typical paper based textbook and thus more complicated to describe in terms of their perceptive qualities.

Second, useful artifacts points to their potential use, as their material properties allows users to perform some actions and forbids others (Proni, 2010, 194). This can be specified in analysis as certain interactional patterns or modes of use. For textbooks, the most common interactions can be described as learning oriented activities such as close reading, note taking and bookmarking, and less so as reading for entertainment. The actual use of artifacts produce interaction codes, which can be found as habitual or prescribed patterns of interaction. These are generally culturally transmitted, but can also be described in accompanying para-artefacts, such as manuals or holy books. In the case of textbooks, interaction codes can be either implicit as part of teaching culture or taught students by their teachers and parents, but they can also be inferred from help guides, accompanying teachers' books and other materials that go along with the textbook.

Artifacts are often built with certain model users in mind. Likewise their physical properties can also inhibit their use by other users. For example, printed textbooks often use thematic color-codes and layouts with complex positioning and interplays of text, images, tables et cetera. While fine for the majority of students at secondary level, it may be less optimal for the colorblind and the blind, not to mention confusing for weaker students at lower comprehension levels.

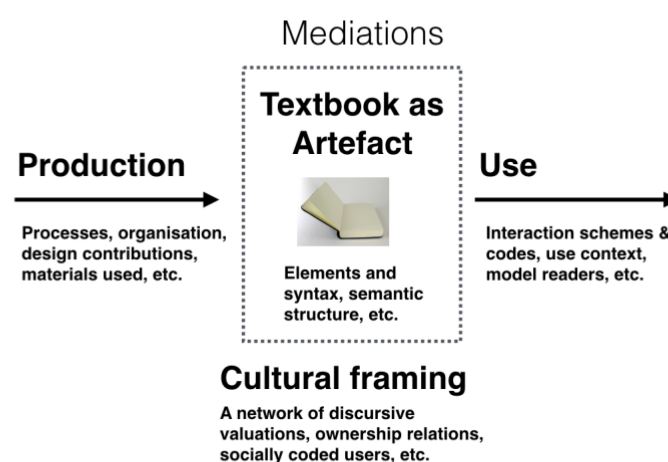
Third, the interpretation of an artifact is not only a function of its perception, its use and its productive circumstances, it is also framed by the mesh of discursive associations that users inevitably will attach to it — the many socially established categories and typologies people tend to attach to artifacts as these partake in social life, such as social status, gender, and other valuations (Proni, 2002, 51). These associations, which I prefer to call cultural framings, may, for instance, be found as the stereotyped valuations of the printed textbook as old fashioned, in books

perceived as appropriate for only certain groups of users, in associations of ownership or in other valuations of digital versus printed materials. Such associations can be observed both in texts contained in the textbook itself, implied in used visual media, in accompanying materials, and in mediations of the artifact in advertising. As mentioned earlier, although we can analytically separate them, use and discourse are never isolated phenomena. The cultural framings of a textbook may severely limit its accepted use or they may reveal unintended uses. On the other hand, the cultural framing of an artifact is also shaped by its use — if you have never read a digital textbook you may not perceive it in the same light as experienced users. The specific discursive associations of the cultural framing are constantly shifting in an infinite process that develops along different threads. Thus cultural framing is best conceptualized as mesh or network of simple and more elaborate interpretations of the artifact, rather than as one simple determining concept or idea.

To sum up, the presented perspective prescribes four areas of analysis: 1) Close description of the material properties of the artifact as perceived by a community of users. 2) An interpretation of the possible uses of the artifact. 3) An interpretation of the markers of production in the artifact. 4) A critical examination of material properties, use and production in relation to the cultural framings found in discursive associations of the artifact. We can study design contributions as those parts of the production of the artifact that materially affects the use and cultural framing of the artifact.

The method proposed here has a hermeneutic character, hence the result is a qualitative, that is an interpretative model of the objects of analysis. The aim of analysis is not to end at one definitive interpretation, but to *simulate* in a model the perceptions of material properties, the possible uses of the artifact, and the mesh of cultural framings available for interpreters. As a simulative model it has a predictive and applicative value. Hence, it may inform future designers of digital textbooks and form the basis for concept-driven interaction design research (Stolterman and Wiberg, 2010) and design criticism (Bardzell and Bardzell, 2013) in relation to how digital textbooks are designed and how their designs perform. Furthermore, good analysis is always guided by a focused research question, and is thus selective in what parts of the analytical framework is applicable. Figure 1 sums up the basic model governing analysis.

Fig. 1 A model for analysis of textbooks as designed artifacts.



Presenting the case: The iBog

In the following I shall demonstrate the approach in an analysis of the web-based *iBog* (iBook) textbooks (note 2), launched in 2010 by the Danish educational publisher, Systime A/S (Oxholm Thomsen, 2010). The current research is based on findings from this author's earlier work, based on qualitative and auto-ethnographic methods (Ebbesen, 2015).

Although actual sales numbers are hard to come by, Systime claims near-monopoly in the market for digital textbooks aimed at secondary educations in Denmark (Poul Henrik Mikkelsen, CEO of Systime, e-mail, Oct 10 2014). Several of the more than 300 titles published at the time of writing has won several gold, silver and bronze medals at the Best European Learning Material Awards in the period from 2011-2015 (Best European Learning Materials Awards, 2015). This doesn't mean that Systime hasn't got capable competitors on the Danish market, among them Matematikfessor.dk and Clio Online. Still, having evolved from a within a traditional textbook publishing business, the *iBog* is a good case to look for digital transitions, as the company, in contrast to the aforementioned entrepreneurial competitors, is moving from a traditional business based on printed schoolbooks to a more or less digital business model. The aim of this case study is thus to trace these digital changes by constructing a analytical model of 1) the material properties of *iBog* as artifact and how these points to its use as a digital textbook, 2) a model of the productive circumstances and design contributions to the *iBog*, and 3) to contrast the perception, use and production of the *iBog* with the mesh of cultural framings found in the discourse on the *iBog*, as it is found in the artifact itself and in promotional materials and other media. I will concentrate on describing only the typical material traits of the *iBog* as it is perceived and used on a computer screen and not go into details with specific layout variations in different titles. These span across the whole curriculum of the students, and as such I shall not focus on individual titles, but on typical traits.

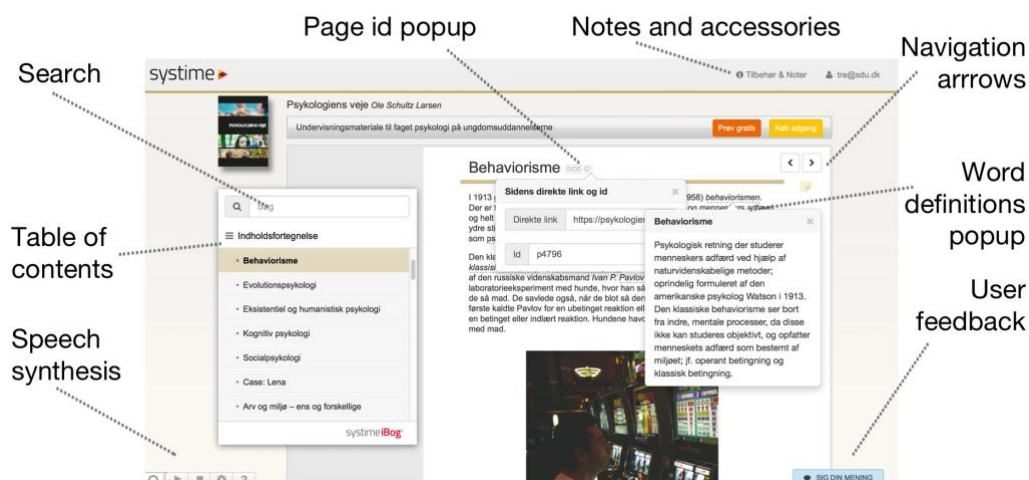
Material properties of the *iBog*

I will begin the analysis by characterizing the material properties of the *iBog* (see fig. 2 and 3). Adhering to the basic typology on e-books suggested by Hawkins, we can differentiate the *iBog* from other types of e-books by categorizing it as a "web accessible book" (Hawkins, 2000, 2). Thus the artifact analyzed is not a downloadable file, but a book-like web-based publication, readable on a computer or other device with a web browser. Essentially a website, the *iBog* can then be understood as a heterogeneous multimodal construct joining several layers of material features of the user interface: text (alphabetic or auditive), graphics (layout, typography, images, colors, etc.) and dynamic elements (video, animations, interactive tables, etc.) (Engholm and Klasttrup, 2004, 62). Among dynamic elements, I suggest that one can furthermore discriminate between content elements, like video and animations, and interactive elements of a more hypertextual or active character, like hyperlinks.

All *iBogs* share a strong material similarity across publication titles. There is limited use of color palettes, and the overall structure of the page is, with few exceptions, similar across all *iBog* titles. The interface of a typical *iBog* is thus shaped in the typical "L"-structure of websites. At the top is a Systime brand logo, links for login, a link with access to notes, a version of the *iBog* as a pdf file and a special "easy reading" visual mode. In a bar below is a small image of a front cover (linking to the front page of the *iBog*), and a short description of the title of the book. At the left is an always-visible dynamic navigation menu, containing a table of contents, a search function, and a special *iBog* logotype. At the right is a main content area that can contain textual and dynamic elements — text images, video-clips, audio clips, animations, quiz tools and other interactive tools, e.g. a mathematical equation and visualization tool. Each element and subelement listed in the table of contents has a page of content associated with it. These pages are endless and vertically scrollable, like a web page, and unlike the finite length of a printed book. At the top of the content area is two arrows for browsing forwards and backwards in the pages of the *iBog*. At the bottom of each page is a speech synthesis mini-player for the reading disabled, as well as a feedback button aimed at end users. Furthermore, all pages are built using responsive design, which means that the placement of page elements adapts to different screen sizes. Furthermore, additional interactive

elements should be mentioned. As web pages, all pages can contain links internal to the specific title or external links. These are marked with underlined text as per website convention. There is also a note function attached to each text paragraph, that allows students to take notes and save them for later retrieval, either in conjunction with the paragraph or on a special, sortable note list on a separate page. Lastly, some terms in the text are marked up as popup word definitions, indicated by dotted text underlines. These are also accessible as a lexicon of terms on a separate page.

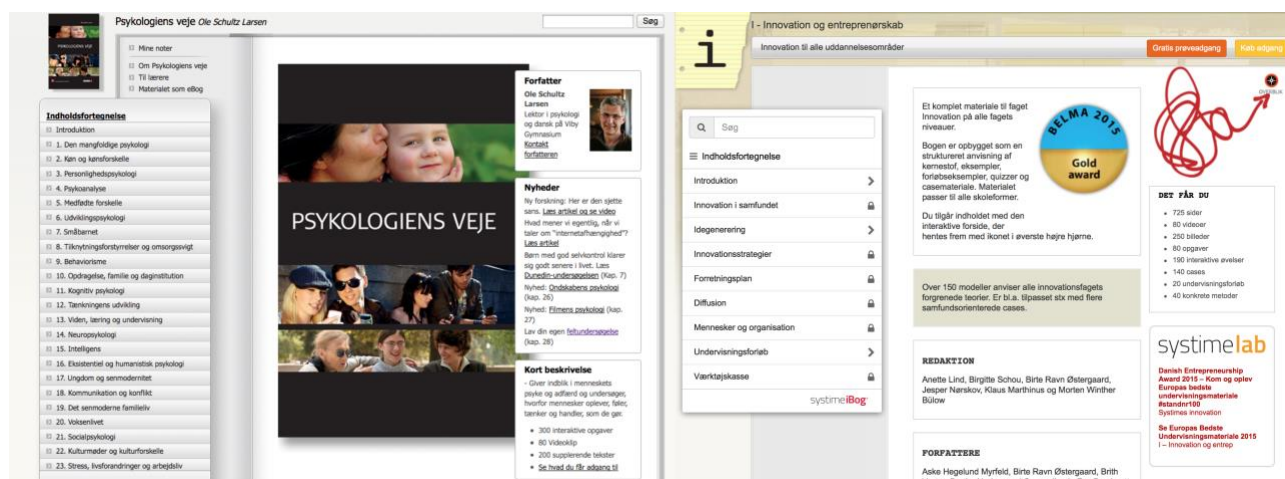
Fig. 2. Interactive and navigational elements of the web based iBog.



The overall visual appearance of the iBog has changed subtly in the period from 2010-2016. At a general level of description, the interface has moved from using visual identifiers found in the traditional printed textbook, calling upon a strong perceptual coding, to a much less book-like interface. Thus, while the use of a more printed book-like overall perception might have been instrumental in earlier versions, the over arching perception is now of a more general website-like character (see the change in fig. 3). The "booklook" was indicated by three features. One was a small picture of a front cover placed at the top left. Although a cover graphic for an online publication could be shaped in any format, this cover picture was shaped in the same upright rectangular shape as a printed book. Second, the cover was placed in a large size format at the front page, reinforcing the visual book metaphor. Third, the background of pages used to have a skeuomorphic background graphic with a strong visual similarity to an open book spread, with the appearance of a book binding in the middle, a stylized representation of a stack of pages and a gradient, as well as a visible edge of a cover. The majority of these traits are removed in later updates of the interface, especially in titles that aren't also sold in printed editions. It no longer seems to be mandatory to place the big front cover on the front page and the visual references to the open book in the background is replaced by a much flatter, non-skeuomorphic design.

Still, visual traits miming the traditional book remain in the iBog. One is the mini book cover shown at the top left. Also important in reinforcing the book metaphor is a prominent table of contents, located at the left side of all pages, that serves as navigational aid. Although, unlike printed books, interactive and visually adaptable, this navigational aid reinforces the semantic structure known from the linear ordering of the content of traditional textbooks (Martinec and Van Leeuwen, 2009, 6). Even though a website can have a much more networked, non-linear structure, the iBog, at least in its table of contents, mimes the traditional book 'stacking' order, where the semantic structure expressed in the table is coincident with the stacking sequence of paper sheets in the printed book. This linearity is reinforced by the navigation arrows of the interface who points 'forward' and 'backward', directions which are obviously fictions in a hyperlinked website, where, in principle, it is possible to read in any sequence. Finally, there seems to be a strong didactical ordering of elements in the table of contents, commonly following the prescribed sub themes as defined in the curriculum of the book.

Fig. 3. iBog front pages with old layout (left) and new layout (right).



Using the iBog

Understanding the usefulness of digital textbooks is basically a question of understanding how they are used for learning. There are numerous ways in which the materiality of printed books are claimed to ease learning in preferable ways: understanding and memorizing difficult subjects, making connections between concepts by using notes and writing in margins, keeping references, aiding visual memory, etc. While according to studies on retention effects of digital reading (Mangen, Walgermo, and Brønnick, 2013) or eye fatigue (Kang, Wang, and Lin, 2009), such functions of reading seem to be less facilitated in the reading of screen based texts, most of this research hasn't dealt with the complexity of interacting with digital textbooks. As argued, the materiality of the iBog is more than a mere text. Indeed, when it comes true understanding or metacognition, the ability to recognize whether you have understood what you read, recent studies show no differences between reading printed materials and electronic materials (Norman and Furnes, 2016; Chen and Catrambone, 2015), and that differences between reading on digital devices and print may be preferential, based on readers age and acquaintance with digital reading, rather than stemming from the digital format itself (Benedetto et al., 2013). Thus, cognitive research on reading seems to support the viewpoint that screen and web-based textbooks, as the iBog, doesn't fare worse than printed textbooks for their basic function as learning devices.

Digital textbooks partially lack some of the functional benefits of printed books. They need power to function. As screen based artifacts, they can't reproduce the same physical mental anchoring that paper pages enable. They also introduce a need for capable carrier device to read on, and thus may widen the gap between economically gifted students and their poorer classmates. At the same time web-based textbooks as the iBog also enables new ways of interacting with the curriculum. This is, for instance, achieved via the various interactive possibilities they offer, via accessibility options (speech synthesis and special high contrast color palettes) and via incorporating different media modalities, such as video, audio, and text that may be seen as catering to different learning styles. Being web-based means that they can be used in conjunction with external bookmarking and note taking tools, and other web services, thus integrating the textbook with a larger network of learning practices. Finally, the ability to access the learning material from any device with internet connection removes barriers for use. For instance, students will never forget their textbooks at home. In summary, the iBog, being manifested in a digital format, is not an exact replica of the physical book, and thus may lack some of the classical benefits of reading textbooks. On the other hand, it enables quite a few new functions and learning possibilities, some of them perhaps problematic.

An interesting perspective on the use of digital textbooks comes from Barry Cull who, in an essay on why college students seem to prefer print textbooks over digital editions, propose to understand students' reading as one of three different modes of reading: 1) Reading for pleasure,

such as reading a novel, purely for entertainment or leisure, 2) reading for study, the attempt to learn and understand something new from a text, and 3) reading to find specific informations (Cull, 2015). Cull further argues that in an age of abundant information access and overwhelming distractions from apps and social media, the primary aim of teaching should not be to ease access to information, but to filter information, to allow for deep reading and learning (Cull, 2015, 33). If the iBog is intended to be learning oriented, as digital reading should according to Foasberg (2014), the web format may work against this purpose, as it seems to compete for attention with other websites and applications on students' computers and mobile devices (Ackerman and Goldsmith, 2011). Indeed, exactly the lack of the ability to navigate and filter information has been shown to impede the learning outcomes of students (Hahnel et al., 2016).

All the above-mentioned properties of the iBog points to restraints and possibilities of its use which the cultural framings of the iBog can be seen to revolve around. I shall return to these, but first follows analysis of production and design contributions to the iBog.

Creating the iBog

At the time of writing, the implied producer of the iBog, the educational publisher Systime A/S, employed 40-50 persons in-house, and several hundred associated authors and editors. Although Systime in an international context would be described as a small publishing company, it is one of the largest Danish educational publishers in the high school textbook market. Systime is owned and controlled by the dominant Danish publishing house, Gyldendal, who accounts for 80-90% of the overall book market in Denmark. Even though coming from the relatively traditional production circumstances of an established publishing house, the technologies and organization of the production of the iBog, at least in some respects, departs radically from the established ways of doing print production and design in the education publishing business.

The iBog is built on top of a database based content management system (CMS), a login service and other software services that serves the features of the website as presented to its end users. The website is the most obvious end product, but as the system can also output other digital formats, the CMS-system is the tangible object, as seen from a production perspective (Troelsen, 2014). In this model it is possible to identify design contributions at five levels, with corresponding different designer roles assigned:

Level one concerns the production of input media that make up the learning material: video, text, images, interactive models, tables, etc. (see fig. 4). These are all pre-produced and designed before they enter the database of the CMS. Elements that are not already digitized are converted to digital formats according to predefined specifications. Production managers and project managers at Systime orchestrate this level of production, but the input media are designed by different types of people from within or outside of the organization: authors, video producers, photographers, graphic illustrators, and interactive designers.

Level two is that of categorization and ordering of these media into "data" or "content" units, which can be processed by the CMS. This also entails assigning metadata to the specific input elements and placing them in specific prescribed reading orders and hierarchies as presented to the end users (or readers). Thus, the iBog is very much the result of semantic ordering and structuring, both on the general level of the whole textbook and on the level of individual pages of content. This work is done in negotiations between hired external authors and editors — teachers or researchers with close knowledge of the subject of the title — and internal project managers, with knowledge of the production system but also with editorial responsibilities.

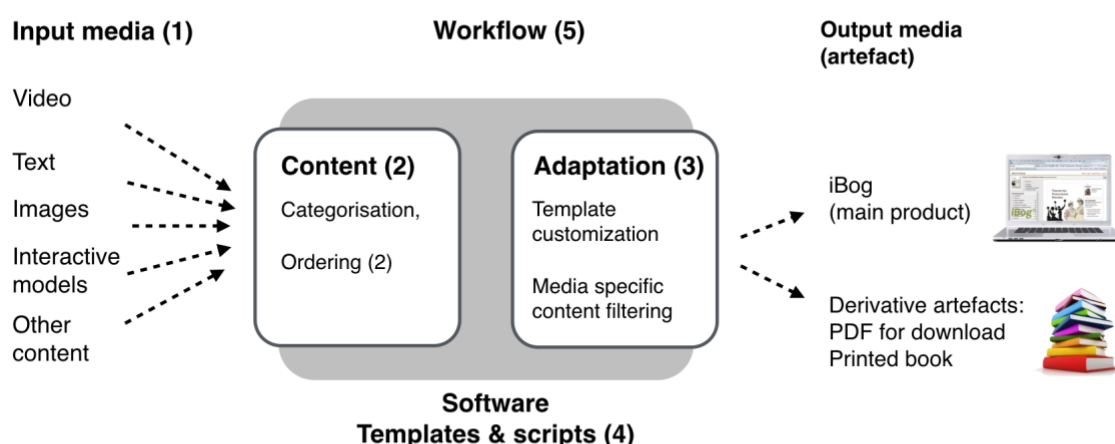
Level three is that of template customization and media specific filtering of data according to the restraints and possibilities of different output media — the regular web version, a downloadable pdf and a print-ready pdf for printed versions. The visual and functional customization of each textbook builds on one of several general templates, defining the layout, typography and color choices of each title, manually adapted to the particular needs of each publication, in addition to output media-specific filters. This level of customization and filtering is executed mainly by the production managers, specialized in managing the technical side of

production.

Level four is the programming of the software that drives the production and distribution of the iBog: the architecture and interfaces of the database, the iBog-specific templates for the user interface and various, automated output scripts defining the possibilities at level three. This work is done by programmers at Systime. The programming of interactive models or alternative navigation interfaces influence many publications. For instance, the title “I - Innovation og entreprenørskab” depends heavily on an additional map-like interface.

Level five is the orchestration and planning of the total workflow of the whole design object, comprising the other four levels. This work is managed and designed in a complex interplay of negotiations between production managers, programmers, project managers and the management of the publishing house. This workflow is determined by management, as well as by production and project managers, in long weekly meetings or special sessions within the company.

Fig. 4. A model of the multiple levels of design contributions in the production workflow of the iBog.



The six levels can, I suggest, be understood as a multiplicity of ‘design contributions’ (Ebbesen, 2015), distributed among the different roles or ‘caretakers’ of design that from a principal viewpoint can all be considered contributors to the design of the rather flexible entity of the iBog. Some design contributors, like the production managers and the programmers, can be said to play a more powerful or defining part in the orchestration of the end product. Still, all contributions are intertwined, and, like a Russian babushka doll, the layers of design, as manifested in the website presented to users, are nested and co-dependent.

Having described and interpreted the material properties, potential uses and the production of the iBog, I shall now move to the last part of analysis, interpreting the cultural framings associated with the artifact.

Framing the iBog

By echoing the printed book, the iBog repeats not only a material form but also invoke a set of cultural framings for its socially coded users. In the case of the iBog, in which school books are paid for by Danish schools, I will argue that the primary users may not be the students supposed to use the iBog for learning, but the teachers and other responsible school personnel who makes buying decisions. Although students may already almost exclusively use digital media in their everyday practice as readers, their teachers may not be ready to abandon books yet. Thus, while the large majority of actual users of the iBog are students, it is plain that they are not the only group of

users that Systime design their products for. Such an interpretation is supported by many discursive cues in the mediating materials from Systime.

First, the iBog is presented as a hybrid between the traditional printed book and the website, mixing the qualities of both: “The iBog combines the best of both worlds,” (authors translation), as the website describing the virtues of the iBog proclaims (“iBogen Om iBog®,” 2014). It continues: “It has the same sequential composition as the book, supplemented with the endless possibilities of the Internet, in the form of interactivity’s [sic] such as quizzes, video, sound and alternative navigation”(authors translation, “iBogen Om iBog®,” 2014) But to be a book chimera is not enough. According to Systime an iBog has to follow certain “dogma rules” for it to be named as such: It has to be Internet based and browser-agnostic. It has to be an independent and coherent work, editorially, curricular and didactically processed and mediated. Finally, it must have notes and internal search functions(Systime 2016). Naming these rules “dogma” refers to the (at least in Denmark) well known "vow of chastity” dogma ’95 rules agreed on by danish film directors in the early nineties, intended to enhance cinematic creativity through setting technological and productive limits on movie production(The Wov of Chastity, n.d.). As the Systime rules mentioned above no doubt limits what can be called an iBog, they might, like the original dogma rules, enhance creativity. But apart from this cultural framing the rules also serves a more mundane role: they support the registered trademark of the iBog: any danish website with learning materials that doesn’t follow these rules might face a trademark dispute. Thus the commercial aspect of these rules is important; they protect the business of the publishers. As such they can be seen as part of an elaborate branding of the iBog.

Central to most conceptions of branding is how companies use a limited set of visual means, such as logotypes, in a coherent manner, so that consumers may in a competitive marketplace identify them as symbols that designate common cultural values held by the company (see Leiss, Kline, and Jhally, 1986; Elliott, Percy, and Pervan, 2011). Professor of design history, Anders V. Munch designates three branding strategies suitable for design analysis: The aforementioned use of logos as cultural symbols, with associated meanings shared by users, the use a common product style unifying the look of artefacts across product lines, and the presence of a common design profile, uniting not only products but also the architecture of company buildings, media, and other material manifestation of the company(Munch, 2010).

In the case of the iBog, Systime can be seen to use logos and design profiling as main strategies. The first strategy is underlined by the consistent use — and trademarking — of the name ‘iBog’ for its web-based publications. In conjunction with the many visual cues, I will argue that this has enabled a transitional home for the iBog within a well-known material culture of books, school bags, pen, paper, and chalk boards within school settings. There is furthermore a strong brand coherence in the design profile across the many iBog titles. Not only are the iBog name and the Systime logo visible on all pages of all titles, the use of a limited palette of templates also enforce a similar visual unity across titles.

Further enforcing an understanding of teachers as the primary socially coded users is the extensive involvement of teachers in most phases of the life cycle of the product. They are involved in the production phase as authors and editors, something prominently advertised on the front pages of many titles, featuring names, bio and photos of the authors. They are also the primary consumers of the iBog as they decide which learning materials are used in classes. They are futhermore enrolled through special courses held by Systime, in favorable free access schemes, and through development blogs aimed at teachers (Systime Lab). Thus the overall cultural framing fits well within the actual involvement of teachers, and in effect creates an impression of co-ownership. However, the ownership model of the iBog is paradoxically quite different from the normal textbook model where books are bought and subsequently owned by schools or student. As explained by Systime, access to the titles are sold as time limited licenses, either as single title access or as general packages giving access to all relevant iBogs to the whole school(“iBøger® – 2 økonomiske Udfordringer & Mange Tak”, 2015). Schools do therefore not own their learning materials in the traditional sense; they are granted a temporary permit to access them.

Conclusion

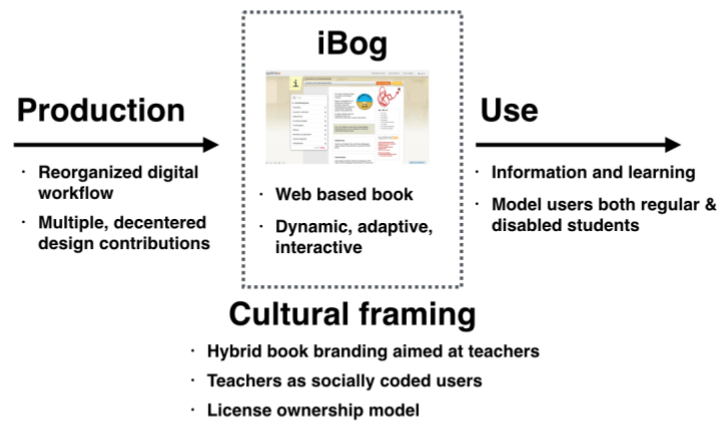
The aim of analysis was not to end at one definitive interpretation of the digital textbook, but to *simulate* the digital textbook as a designed artifact. In conclusion, the method, inspired by Proni and transferred to the analysis of digital books, has been used as a coherent but flexible tool to model the many design aspects possible to discover and describe when analyzing the design challenges that publishers of digital text faces. I would argue that the main value of the method is the analytic separation of the various conceptions of design into four categories, covering the artifact. The method thus outlined four main areas of design analysis: material properties, use, production and cultural framing. Furthermore design contributions can be specified as the work of creating tangible objects both for use and for fitting into the cultural framings of users.

The analysis of the case showed that the iBog is the product of sometimes very immaterial and elusive processes of the five levels of designing in a reorganized production workflow where design contributions was seen to be rather decentered. Thus many of the people involved in the production process can be designated designers. Although some traits, like the stacking and didactic ordering of content of level two in the design process, can still be observed to echo the production process the printed textbook, the production of the iBog is very different.

As an artifact the web-based iBog was seen to be dynamic, adaptive and interactive, at least in its web-based incarnation. Its function as a digital textbook was examined critically in the light of different modes of reading for learning. In a first interpretation the iBog could be characterized as simply remediating printed textbooks (Bolter and Grusin, 1996), but in closer analysis the case was more complex. A mix of functional and visual traits, derived from printed books, associating the iBog as a hybrid book/website, were argued to be a part of larger business building and branding efforts aimed at teachers. Licensing models were furthermore a part of the destabilization of the well-known cultural framing of the textbook in school contexts. This is summarized in figure 5.

The iBog can, like most digital textbooks, be criticized for not enabling much more advanced interactions, deeper customization levels or more integration with social media and web services, strengthening their actual use as nodes in the greater networks that students today immerse themselves in, as Chiara Lino has suggested (2016). I would suggest that giving students full access to such functions would be perceived as a threat to existing social structures based on traditional teacher and student roles, and the role of the schooling systems defining the curriculum.

Fig. 5. An analytic model of the iBog as a designed artifact.



The purpose of introducing the case was to demonstrate the viability of the suggested design analytic method. While the analysis of the iBog case no doubt could be pursued further in depth, both regarding more research on actual use and describing the artifact and its cultural framing even closer, I argue that the case demonstrates in a sufficient way the advantages of this kind of simulative modeling.

Finally, the proposed perspective may contribute to a more nuanced understanding of the circuit of books as more than just communication in the common sense of that word, meaning transfer. Focus on the materialities of design and designerly contributions indicates a more active role played by non-communicative elements and events, e.g. use, production and artefactual materiality, involved as agents or mediators in the production and consumption of digital textbooks, or indeed books in general (see also Lees-Maffei, 2009).

Endnotes

1. The education level is in Denmark called “ungdomsuddannelser“, youth educations, equivalent to upper secondary school (uk) or high school (us), with students typically being 15-18 years old.
2. The iBog™ is a public trademark owned by Systime A/S.

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